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Electrosonic: Barclays Global Command Centre, Radbroke Hall, Cheshire

Big data with big screens

In command and control systems it's the quality of the AV equipment that guarantees the quality of the user experience, reports *Paul Bray*.

Once the dominant technology in command and control centres – if you don't count whiteboards and felt-tip pens – AV is now having to share the limelight.

“AV usage in command and control is changing as it has no choice but to deal with more and more IT signals and information,” says Paul Vander Plaetse, CEO of VuWall. “The tools to control content and AV equipment are increasingly based on IT software and hardware to the point where the AV portion is now limited to the end points (screens and speakers). Even the transport of most AV signals is now accomplished with IT cables.”

Smaller slices of the cake

However, as Vander Plaetse points out, while AV's share of the cake is getting smaller, it still contains the icing, because it's the quality of the AV equip-

ment that guarantees the quality of the user experience.

“Developments in AI and machine vision notwithstanding, the most sophisticated component of any effective command and control system is still the well-informed and attentive human operator,” agrees Peter van Dijk, EMEA business development manager at Mitsubishi. “So a human-friendly means of visualising and analysing intelligence (ie. AV) is still central.”

“The emergence of big data in a usable format is revolutionising command and control applications,” adds Johanna Ocampo, marketing director at Silicon-Core. “From traffic management, CCTV and communication centres through to natural disaster, government and corporate network operations centres, the production of data into graphic form is making these environments more visual in nature, allowing for

more relevant and faster decision making.”

“We're seeing a trend towards the augmentation of the traditional main videowall with the addition of smaller displays which are used as workstations within the control room area, in separate break-out rooms, or both,” says van Dijk. “The driver for this ‘multiscreen’ approach is the increasing amount of data flowing into the average control room, and the need for operators to be able to structure it to ensure they're not overloaded with information and can remain focused on the most mission critical aspects.”

Operator workstations

In recent years operator workstations have grown from one to two screens to four to eight screens or more, says Ben Dale, product manager at Datapath. “In contrast, the main videowall is shrinking.”

According to van Dijk, a major development is the relative ease with which command and control data can be made available to people outside the control room environment. “For example, a manager at a remote location can have realtime access to the same data that operators are seeing in the control room,” he says.

“The growing use of native IP networks within AV has made it much easier to deliver these kinds of multifaceted, highly versatile systems. We're increasingly dealing with projects that wouldn't have been feasible in any other way – for example our recent installation at Eti Bakir in Turkey, which features a hierarchical command and control network of six independently-operating control rooms, overseen by a central management suite and associated break-out rooms. Everything is connected via the same physical network infrastructure, but with the subordinate systems siloed within their own virtual networks.”

“The replacement of matrix switching with an AVoIP network infrastructure is giving command and control centres more flexibility in design, scale and future-readiness, both in terms of (interactive) applications and the ability to be reconfigured to meet new or changing needs,” says Rob Muddiman, EMEA sales director at ZeeVee (a founder member of the SDVoE).

However, argues Dale, this also introduces significant security and deployment considerations. “Squeezing sources over an IP network brings visual quality considerations and, perhaps most importantly for command

and control, latency issues. Unless the use of encoded video streams (typically H.264/5) for the primary control aspect is immediately written out, the high encoding latency makes realtime 'control' clunky and difficult to use. The commoditisation of 10G networking components now allows 'uncompressed' or 'visually lossless' compression techniques to be employed that don't incur the same latency penalty."

To ensure the best possible performance, with pixel-for-pixel quality video distribution and near zero latency, the SDVoE AVoIP distribution solution is often the only option, believes Mudiman. "It offers a high degree of flexibility so that the number of endpoints can be adjusted as necessary for additional sources and monitors," he says.

Visual characteristics

The visual characteristics of a videowall or screen are also critical, providing high image quality adaptable to the type of content, according to Ocampo. "Some types of content require extremely high greyscale or colour rendition while others call for high contrast to ensure maximum legibility. All solutions must ensure minimum eye fatigue, achieved through a high refresh rate and accurate brightness. And because numerous operators may be using the videowall simultaneously, it must be viewable from any seat in the room, with great off-axis viewing."

Once dominated by rear projection

and LCD, the market is gradually shifting to direct-view LED.

"As LED pixel pitch moves to sub-1mm and 2mm sizes, these seamless displays can compete with projection and LCD videowall configurations," says Ocampo. "The benefit of wider viewing angles, high brightness, guaranteed uniformity and minimal service and operating costs are justifying the investment. LED also has a higher refresh rate which is easier on the eyes so more data can be comfortably analysed."

"With several major narrow pixel pitch LED control room projects successfully delivered over the last few years – for example the new Tokyo Police HQ built in advance of the 2020 Olympics – we're seeing growing confidence in the technology," adds van Dijk.

Buyers should certainly consider 4K, Dale believes. 4K video sources are increasingly common, so a 4K control room solution is ideal because a) operators are close to their screens where the detail matters, and b) having more pixels offers the opportunity to monitor more sources simultaneously in more detail.

In future there will be a role for 8K and even 12K, argues David Margolin, vice-president of marketing at Kramer Electronics. "Displays that show vast amounts of additional detail will increase and improve a command and control centre's functionality, such as the identification of vehicles and peo-



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Natural Power's new control centre in Scotland claims to be the UK's largest independently operated 24/7 control room. The company wanted to create an improved working environment for operators who were often working long hours under stressful conditions, enabling 24/7 monitoring and a more flexible, responsive service for its clients. "The new centre features realtime data provision and advanced security features to deliver 24/7

intelligent management of assets," says Doug Walker, experiential technology advisor at installer, Electrosonic. "A custom videowall linked to operator consoles maximises situational awareness. Human factors are prioritised in an ergonomic environment with improved sound, lighting and room layout. And the solution will scale for growth, with the flexibility to add new services and collaborate with specialist suppliers."



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ple. In addition, these resolutions will enable the display of additional layers of content on current display sizes.”

In an emergency it is even possible to call up a fully functioning control centre in the back of a truck. “A tactical operations centre (TOC) is used by the military and police as a command post where officers and technicians monitor operations and maintain lines of communication,” says Mary Ann de Lares Norris, EMEA vice-president of Oblong. “IBM is leading the field with its pioneering X-Force Command Cyber Tactical Operations Center, the industry’s first mobile cyber range and watch floor, with 23 tonnes of cyber capabilities on wheels. It can run an entire corporate IT environment for simulated cyber training, incident response and tactical operations.”

For any command and control environment, reliability is obviously a key requirement, to ensure continuous running and optimum performance. “This takes various forms, one being the operational quality of visual equipment to ensure long life performance, such as heat management and professional components for operating 24/7,” says



Kramer: The municipal centre in Rishon Letzion, TelAviv – the city’s hotline for public inquiries – has installed Kramer KDS-DEC6 decoders and KDS-EN6 encoders to distribute HDMI over IP feeds to its videowall displays to access and view, for example, live feeds and stills from the city’s 1,200-plus street cameras, using Kramer Network to increase levels of control and management.

Stephen Wair, end user account manager at NEC Display Solutions. “Other requirements include ensuring that a failure in one part of the system won’t affect the system as a whole, and redundancy, whereby a back-up system or a

second power supply is available should the other fail.”

Another essential requirement is ease of use. “Everyone in a team needs to be able to effectively adopt the technology without time-consuming train-

ing, and tools need to be intuitive and flexible so teams can get straight to the important tasks without delays in set-up or connectivity,” says Norris. “An internal champion or specialist within the organisation is essential to ensure rapid user adoption and to ensure the technology is being used to its full potential.”

For Margolin the most important challenges are scalability and flexibility. “These support future growth (additional sources and displays), as command and control centres in municipal and high-level security markets are very dynamic and prone to constant change due to new technologies and new requirements.”

“While a videowall may continue operating with no further intervention for many years, the underlying infrastructure will almost certainly change over time,” adds van Dijk. “So it has to be easy to integrate new elements into a system or change the way it operates. One way in which this is being achieved is the use of native IP videowall processing, and this approach is becoming increasingly popular as AV becomes more deeply integrated into the overall system architecture.” ■






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